Quarkonium Topical Group update

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Tracking work

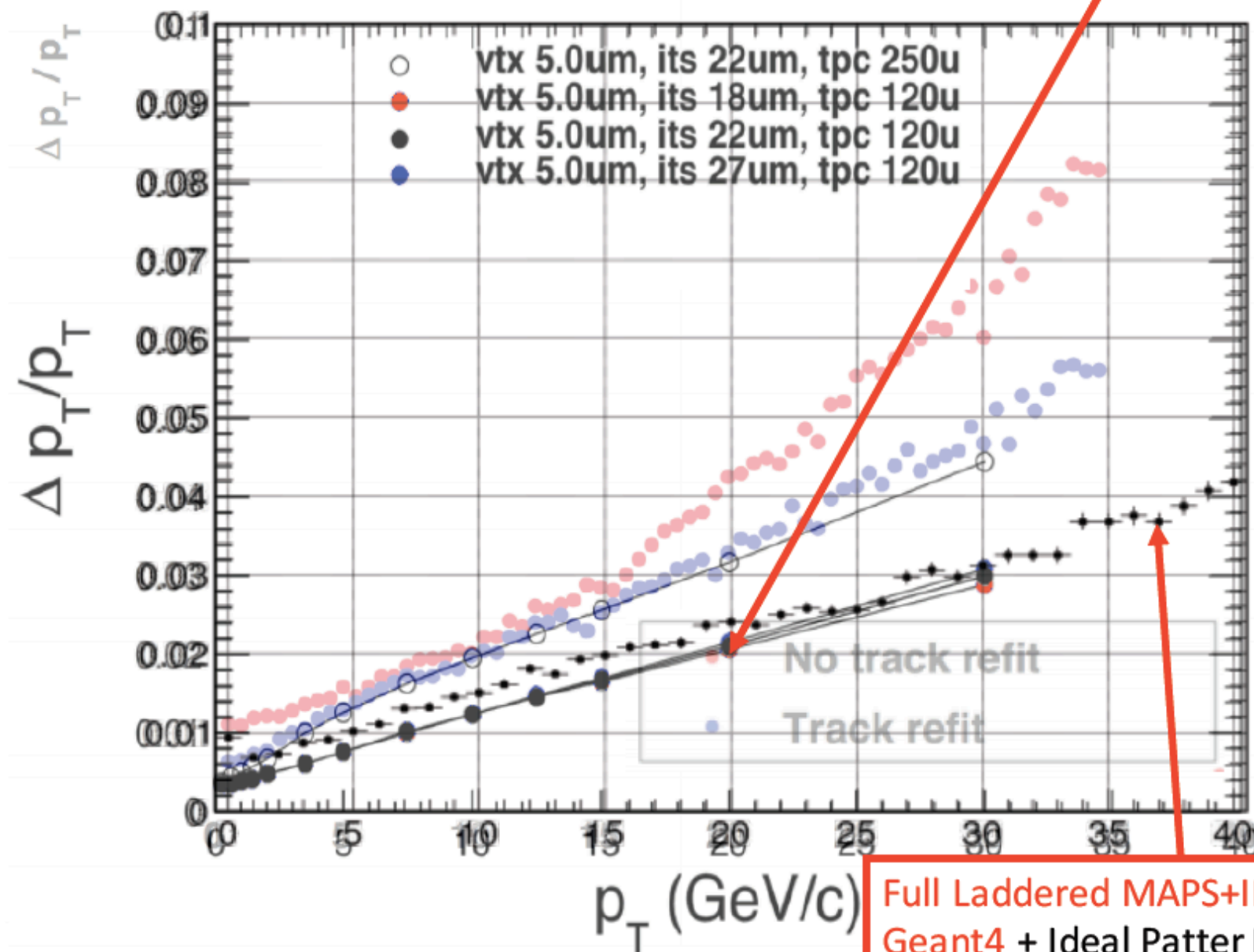A major upgrade of the tracking software is going on now.

We needed to do this anyway for many reasons, but it became urgent when we realized that the existing software produces momentum measurements that are poorer than the actual capability of the tracker. This seems to be caused by the association of clusters with tracks.

There were independent demonstrations by Christof Roland and Haiwang Yu that the tracker we now plan to build (including realistic mass of INTT) should be capable of ~ 80 MeV Upsilon resolution.

Tracking work - cont.

Compare with LiC fast simulation

Bench mark: LiC toy simulation by Christof Roland

vtx 5.0um, its 22um, tpc 250u
vtx 5.0um, its 18um, tpc 120u
vtx 5.0um, its 22um, tpc 120u
vtx 5.0um, its 27um, tpc 120u

No track refit

Track refit

Full Laddered MAPS+INTT+TPC Geant4 + Ideal Patter Recognition + Full Kalman fit (GenFit2)

Tracking work

The solution is to redesign the tracking software. See the slides by Christof at:

https://indico.bnl.gov/conferenceDisplay.py?confId=2964

and there is also a document that we filled out at the tracking meeting on March 21 with a task list and names of people who are working on the tasks.

Our goal is to have something working on a time scale of a few weeks.

Tracking work - cont.

The main contributors to the upgrade of the tracking code are:

Christof Roland
Haiwang Yu
Carlos Perez
Veronica Canoa
Sourav Tarafdar
Sanghoon Lim

With considerable consultation by Jin Juang.

There is rapid progress!

Other news

Sasha Lebedev at ISU has been working on updating the background estimates for the Upsilon measurement. He is very close to being done, should be ~ 1 week.

A new postdoc is coming to ISU who will work full time on QTG simulations.

We are planning to investigate the feasibility of using the open bottom cross section as a baseline for the Upsilon measurement, to avoid theoretical uncertainties associated with cold nuclear matter effects. Not clear if this is feasible. Sourav has agreed to look into using dE/dx in the TPC in the simulations.